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6 SYSTEM AND METHOD FOR CONSOLIDATED SHIPPING AND  
7 RECEIVING USING REUSABLE CONTAINERS  
8

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11 Background of the Invention

12 This invention pertains to a system and method for shipping products in  
13 commerce. This invention also pertains to a system and method for tracking shipping  
14 containers and the returning of shipping containers.

15 With the arrival of the internet, many existing businesses have changed the way  
16 they do business. The driving force behind this change is E-commerce ("EC"), short for  
17 electronic commerce, as trading on the internet is known. There are several types of E-  
18 commerce, e.g. business to business (B2B), business to consumer (B2C) and consumer to  
19 consumer. The most notable form of consumer to consumer E-commerce is in the form  
20 of auctions.

21 One problem in E-commerce is shipping. Some E-commerce companies ship  
22 directly from a warehouse to the recipient, e.g. using one of the currently existing parcel  
23 services. Although not very expensive, for small items the shipping costs can be  
24 substantial. However, the costs of shipping can be partially offset by the avoidance of  
25 local sales taxes when the purchaser and vendor are from different states.

26 There are several problems other than shipping. For example, returning  
27 purchased items can be inconvenient. Even receiving the purchased items can be  
28 inconvenient e.g., if no one is home during office hours, when most deliveries occur.

1 In order to accommodate purchasers, some grocery deliverers offer to have a  
2 buyer deposit a key with the deliverer. The deliverer's employees can then enter the  
3 buyer's home unattended. This creates several problems. For example, disputes can  
4 arise, since no one signs for goods that are delivered.

5 Another problem is that the privacy and security of the homeowner are  
6 compromised. Further, since the drivers must also have all relevant alarm codes, they  
7 may become prime targets for robberies, not so much for the goods on the truck, but for  
8 the keys and alarm codes that they carry.

9 Another problem is when unsupervised children are at home. When drivers are  
10 hired, normally the background checks on those drivers are not very extensive. This  
11 creates risks for the unsupervised children, and their possible exposure to undesirable  
12 elements.

13 Our U.S. Patent Application Serial No. 09/481,783, filed January 11, 2000,  
14 teaches a system and method for low cost delivery of goods, without intruding into the  
15 sanctity of the home. This system and method permits signing for delivery and  
16 facilitating easy and inexpensive return of unwanted merchandise, in a manner that is  
17 easy for the purchaser and efficient for the business. (The '783 application is  
18 incorporated herein by reference.)

19 It would be desirable to reduce the cost and improve service quality of a system  
20 and method for delivery of goods by allowing better tracking of shipments. It would also  
21 be desirable to reduce cost and waste associated with such a system and method. In  
22 particular, it would be desirable to reduce the waste and cost associated with the  
23 containers used to ship and/or deliver goods.

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Summary

A method in accordance with the invention comprises the steps of providing goods to purchasers in reusable containers. When the purchaser returns the reusable containers, a deposit can be credited to the purchaser's account.

In accordance with one novel feature of the invention, tracking apparatus such as an RFID ("Radio Frequency Identification) is attached to the reusable container. (As explained below, RFIDs are well known, and comprise a small radio transmission device. The RFID can be electronically queried, and in response to such querying, provide a data signal identifying the particular RFID.)

In one embodiment, prior to delivering goods to the purchaser in the reusable container, the vendor makes an entry in a memory device (e.g. a RAM, memory disk, memory tape, or other device) identifying the reusable container and the purchaser to whom the container is being delivered. When the purchaser returns the container to the vendor, the return of the container can be electronically tracked. Specifically, the RFID attached to the returned container is again electronically queried, and the information provided by the RFID can be entered into the above-mentioned memory device, thereby indicating that the reusable container has been returned. The deposit can thus be credited to the purchaser's account automatically. This reduces the expense of tracking the return of reusable containers. This facilitates the use of reusable containers, which would be prohibitively expensive for shipping goods if they were not returned to the shipper or vendor.

1 In one embodiment, the goods are shipped to customers in accordance with the  
2 method taught in the '783 application.

3 Also, in one embodiment, the RFID can be used to track the goods in the  
4 container as they are shipped through the distribution network to the customer.

5  
6 Brief Description of the Drawing

7 Fig. 1 is a block diagram illustrating a system for ordering goods and providing  
8 those goods to a purchaser through consolidated shipping in accordance with our '783  
9 application.

10 Fig. 2 illustrates an example of a reusable shipping container with an integrated  
11 RFID for facilitating tracking

12 Fig. 3 illustrates a reusable pallet for carrying or holding reusable containers.

13  
14 Detailed Description

15 In this patent we will first describe the system taught in our '783 application. As  
16 mentioned above, this system provides purchased goods to customers in an efficient  
17 manner. We will then describe an improvement whereby goods are packaged in  
18 containers using RFID tracking apparatus.

19 In a system in accordance with the '783 application, a purchaser places an order  
20 online from his or her net appliance (typically a personal computer 100), either at work or  
21 at home. Computer 100 is connected via an internet service provider (ISP) 102 to  
22 internet 101. The purchaser accesses internet 101 via computer 100 to order goods from  
23 a plurality of vendors. The vendors can be any of numerous types of vendors, e.g.

1 vendors of groceries, electronic goods, hardware items, office supplies, appliances,  
2 furniture, gardening goods, clothing, perfume, etc.

3 In order to order these goods, the purchaser has several options. For example, the  
4 purchaser can connect to a portal 120 via a connection 110. In one embodiment, portal  
5 120 is a server. Connection 110 is invoked by accessing the URL (universal resource  
6 locator) of portal 120 in the same way that internet web pages are typically accessed.  
7 Portal 120 offers connections 122a to 122d to associated vendors, symbolized by boxes  
8 130a to 130d, each having a server coupled for receiving orders from portal 120. Each  
9 vendor is typically an independent company. The purchaser communicates via portal  
10 120 with vendors 130 to order goods from each vendor. The purchaser also typically  
11 instructs the vendors when the goods are to be picked up and the location from which the  
12 goods are to be picked up. As explained below, the purchaser has a choice of several  
13 central locations SML1 to SML3 from which he or she can pick up the goods. (The  
14 servers of vendors 130 may provide availability information so that the purchaser can  
15 have an idea as to the earliest possible time for pick-up.) The purchaser can either pay  
16 for the goods at this point in the transaction using a credit card, or at the location and time  
17 of pick-up.

18 A purchaser also has the option of communicating with vendors 130a to 130d  
19 without going through portal 120, e.g. by accessing the servers of vendors 130a to 130d  
20 directly through the internet. This is symbolically illustrated by connections 121a to  
21 121d for connecting ISP 102 directly to one or more of vendors 130a to 130d. In one  
22 embodiment, vendors 130a to 130d have their own internet web site, and are contacted  
23 via their URLs. A purchaser can use a bookmark in his or her browser, or contact



1 forwarded to a selected one of exemplary supermarkets SML1 to SML3 for pickup. (The  
2 specific supermarket SML is typically selected by the user at the time of ordering.)  
3 Alternatively, vendors 130a to 130c can bypass warehouse 150 and ship ordered goods  
4 directly to one of exemplary supermarkets SML1 to SML3 for consolidation and pick-up.  
5 (In the embodiment of Fig. 1, establishments SML1 to SML3 are supermarkets.  
6 However, establishments SML1 to SML3 can be any kind of retail establishment.)

7 Vendor 130d uses a different technique, in that it has a warehouse 140d merged  
8 into regional warehouse 150. In some embodiments, there is only one regional  
9 warehouse. In other embodiments, there are many regional warehouses across the  
10 country. Each regional warehouse 150 consolidates orders for purchasers in a particular  
11 geographic area.

12 In some embodiments, supermarkets SML may use the same approach to allow a  
13 user to pre-order groceries (e.g. via the internet), and have them bagged and ready for  
14 pickup at the same time as the goods from warehouses 140. This is facilitated by also  
15 informing supermarkets SML as to what groceries are being pre-ordered, and when the  
16 purchaser will pick up these groceries. This information is provided by internet appliance  
17 100 to supermarkets SML via internet links 121 or 110, and electronic links 135 at the  
18 time the groceries are being pre-ordered. (Links 135 are provided between vendors 130  
19 and supermarkets SML. Only a few of links 135 are shown in Fig. 1. One or more  
20 computer terminals or PCs including one or more data output devices are provided at  
21 supermarkets SML so that personnel at supermarkets SML are made aware of the pre-  
22 ordering of groceries.) Vendors 130 also inform supermarkets SML, via links 135, when  
23 the goods from vendors 130 are to be delivered. Along with this information, handling

instructions may also be sent, e.g. to open and show the purchaser a certain product and let him sign a receipt reflecting inspection of the actual product and its function, rather than merely signing a receipt reflecting receipt of just a box.

After the goods are ordered from vendors 130, consolidated and provided to one of supermarkets SML, and/or groceries are ordered from one of supermarkets SML, the purchaser can then come to that supermarket SML, at the mutually agreed time, and pick up both pre-ordered groceries and the goods freshly delivered by vendors 130. The purchaser may also quickly browse the supermarket first, for the few items he forgot to pre-order.

In one embodiment, the purchaser may use his credit card, store card or other type of magnetic or electronic card when first stepping into the cash register line. This can be accomplished by passing the card through an electronic card reader to inform appropriate inventory order processing/control automation or personnel of the purchaser's arrival.

Thus, by the time the purchaser gets to the register, a bag handler can bring the purchased goods to the register for pickup, ready in a cart, with printed instructions, or instructions on the display of the cash register. An example of a typical printed instruction is an instruction concerning the filling out of a warranty card, instructions concerning use of the product, or an instruction concerning obtaining a cash rebate from a manufacturer.

An additional option is to allow the purchaser to scan his credit card or a store club card at the entrance of supermarket SML, thereby permitting the supermarket to respond by pulling the ordered merchandise to have the merchandise ready at the checkout counter.



When returning an item, the purchaser brings in a receipt and the item to the supermarket SML, and gets credit after the clerk checks return instructions with the vendor. This can be done using one of computer links 135 between supermarket SML and vendors 130. Of importance, a method in accordance with one embodiment of the '783 method permits a user to return goods from any of numerous vendors 130 to one location (e.g. one of supermarkets SML), thereby saving the purchaser from the inconvenience of having to make numerous trips to numerous locations.

This method allows so called brick and mortar stores to stay competitive with e-commerce vendors by adopting certain aspects of E-commerce and becoming a one stop service center for purchasers, e.g. open 7 days a week, 24 hours per day. While the above-described method is typically used by supermarkets SML, in other embodiments, it is used by drug stores, convenience stores, or other types of sales establishments. These other types of sales establishments can serve as distribution hubs for many different kinds of goods from the various vendors 130. In lieu of a retail establishment, a warehouse such as warehouse 150 can serve as the pick-up point.

To enhance operation of the system, once orders are accepted, they are immediately transferred from the vendor 130 accepting the order to its warehouse 140, as well as the downstream supermarket SML handling the transaction. The warehouse computer system (designated as 150a in Fig. 1) and/or the supermarket computer system can also manage logistics, such as transportation in a manner known in the art. There are numerous ways to inter-network multiple servers using WANs (e.g. the internet) so that any computer or server or cluster of servers can be used to embed any function. In some cases so called proxy servers may be used to interface parts of the system. In other cases,

1 proxy servers, or parts of the service can be outsourced to so-called Application Service  
2 Providers (ASPs). In other cases, special protocols, such as XML (extensible markup  
3 language) or DHTML (dynamic hypertext markup language) etc. or alternatively  
4 “drivers”, “pipes”, “adapters” etc. can be used. By using any or any combinations of the  
5 above listed or similar software elements in any physical combination of servers or  
6 equivalents, an essentially equivalent system can be built. Both the physical and logical  
7 topology of the system are very flexible, although it is desirable to have the logical  
8 topology approximate the physical flow for merchandise to reduce the risk of  
9 miscommunication.

10 In lieu of using a network such as internet 101, in another embodiment, the user  
11 contacts the store SML and/or vendors 130 by telephone, e.g. using a toll free number  
12 such as an 800 number, and using an automatic number identification (ANI) Caller-ID  
13 system to identify the purchaser. A server then notifies the store and instructs the store  
14 via telephone to ready the merchandise so that by the time the purchaser reaches the  
15 store, the merchandise is placed in suitable containers (e.g. bags) for the purchaser to pick  
16 up. Systems that can receive a phone call and actuate computer programs are well known  
17 in the art, and are sometimes referred to as Interactive Voice Response (IVR), or Voice  
18 Response Units (VRU).

19 Optionally, a local courier service or an existing delivery service of the local store  
20 can be used to make a local, consolidated delivery from one of supermarkets SML (or  
21 central warehouse 150) to the purchaser.

1 The various options for providing goods to purchasers (e.g. pick-up at  
2 supermarkets SML or consolidated delivery) are indicated by arrow bundles 160a to  
3 160c, symbolizing the flow of goods out of supermarkets SML.

4 In another aspect of the '783 method, supermarkets SML can provide bonuses, or  
5 enhanced bonuses for pre-ordered items such as staples like milk, bread, flour, etc., since  
6 it permits the store to run a tighter inventory, but still meet all the demand. (Such  
7 bonuses can be in the form of cash discounts or bonus point programs, wherein the points  
8 can be traded in for various products.)

9 The '783 application further describes an enhanced method in which pickup is  
10 arranged using a specially designated area within market SML containing numbered  
11 boxes or lockers. When a purchaser arrives at a given time, he or she can pick up his or  
12 her merchandise simply by going to an assigned locker and entering a onetime password  
13 on a control panel associated with the locker. This unlocks the locker and permits the  
14 purchaser to pick up the goods and exit the store without further delay. Lockers are not  
15 typically permanently assigned, but rather, are assigned when the pickup time is  
16 established. The password can be selected by the vendor or market SML and  
17 communicated to the purchaser at the time he or she orders the goods. Alternatively, the  
18 purchaser can select the password at the time he or she orders the goods. In yet another  
19 embodiment, the purchaser may have a pre-assigned password that is unique to that  
20 purchaser, and used for all the purchaser's transactions.

21 Alternatively, instead of a password, the purchaser scans his store card or credit  
22 card with an electronic card scanner/reader located on the locker. (This use of the credit  
23 card can also be the means by which the purchased goods are paid for.) This unlocks the

locker and permits the purchaser to exit the store without further delay. (The control panel or scanner is typically in electronic communication with a computer system within supermarket SML that receives order information via one of links 135. Thus, the distribution system can control which credit card or pass combination the locker responds to. The distribution system also monitors when pick-up has occurred.)

Optionally, at the request of the customer, or by default, the customer may be alerted by an alerting system to the availability of his or her goods. That alerting system may be for example a voice call (automated from one of the servers such as a server at the pickup location or elsewhere and a connected voice response unit), e-mail from a server with or without a human caller, e-mail in conjunction with a page from an electronic pager, a message provided on a cell phone, or other alerting method or system. In some embodiments a message board in the pick up location (e.g. store) may flash an order number to indicate availability.

The invention described in our '783 application can be practiced using stores or other commercial establishments other than supermarkets. For example, any type of chain (e.g. regional, local, national or global) that has supply chain management can use a method in accordance with the invention, e.g. drug stores, convenience stores, mail outlets such as the U.S. Postal Service, Mail Boxes etc.<sup>TM</sup>, gas stations, warehouse stores, banks or other chains or franchise outlets that have substantial traffic. In some embodiments, no prior arrangement with the store is required, to have products delivered there. Also, the purchaser does not have to have a special preexisting contractual arrangement with the store to receive goods there, other than the specific order that he or

1 she placed via the internet. In this embodiment, the purchaser may or may not incur  
2 expense, other than the specific order, to receive goods at the store.

3 Depending on the type of supply chain management implemented, local or  
4 regional centers may not necessarily be owned or operated by a retail chain, but rather by  
5 a third party, such as a wholesaler or a large vendor, selling key items such as bread, soft  
6 drinks, etc. which require daily deliveries.

7 Modules for internet-to-supply chain management (SCM) software can be  
8 provided that follow preset rules, and invoke auxiliary services, such as instruction  
9 printing at the outset of ordering merchandise, warranties, the setup of a software  
10 installation (when required), etc. Such software can be partitioned and implemented in  
11 many ways, and can be hosted on any of one or several servers, including the servers  
12 shown in Fig. 1. The novel approach is to link two or more vendors via the portal  
13 function, where the buyer communicates to the vendors what product is being purchased,  
14 and how/when it will be delivered or picked up. For simplicity, the pickup/delivery  
15 facility within the store (e.g. pick-up boxes) is not shown here in Fig. 1. As described  
16 above, more than two vendors can be included in one transaction, which creates  
17 synergistic sales and has a single delivery system.

18 The above-described system can be further improved, and both cost and service  
19 aspects can be improved, by introducing an RFID (Radio Frequency IDentification) tag  
20 in a re-useable container. RFID tags are well known. They are small apparatus that can  
21 be affixed to a container and queried via radio waves. When queried, they provide  
22 identification information. RFID tags are described, for example, by Amanda Loudin,  
23 "RFID Comes Into Its Own", published by Warehousing Management

1 (<http://www.warehousing.com/FEATURES/WM0499F2.HTM>), "FASTRAK and  
2 OTHER RFID Systems" (<http://cwc.ucsd.edu/-chapelle/RFID/rfid.html>), "New 13.56 MHz Tag  
3 Opens RFID to New Applications Tag Provides High Performance at Low Cost"  
4 (<http://www.businesswire.com/webbox/bw.020199/983835.htm>), and Eric Sells, "New  
5 RFID Tag Chip Features Advanced Anti-Collision with Simultaneous Interrogation of 10  
6 Tags" (<http://www.microchip.com/0/Company/Edit/pRelease/PR78/index.htm>). These  
7 documents are being submitted in an information disclosure statement filed herewith and  
8 incorporated herein by reference.

9       RFIDs are seldom used in consumer applications, because at about 0.5 to 2 dollars  
10 per unit they would become a substantial cost element, especially when a typical shipping  
11 cost is about 1 to 3 dollars for small parcels for mass shippers.

12       Cardboard boxes typically used for shipping, and the labor required to prepare the  
13 boxes for shipping, impact the cost of shipping, as it can take a couple of minutes to  
14 prepare a box. The box itself can cost 0.5 to 2 dollars.

15       By using reusable containers that have an RFID built in, those costs can be  
16 reduced. Similar to a bottle redemption value, a 2 to 10 dollar charge (depending on  
17 market acceptance and actual cost of container with a RFID) can be levied if the  
18 purchaser does not return the container within a certain time period in useable state (e.g.  
19 not dirty or damaged) to one of the outlets (e.g. supermarkets SML). That free time  
20 period is provided to allow the purchaser to use the original shipping box to return a  
21 purchased item, thus preserving the item's appearance and preventing it from being  
22 damaged during the process of returning it.

1           Inside the reusable container, air inflatable bags, bubble wrap, Styrofoam  
2   "peanuts," or other structures can be used to stabilize and protect the contents. They can  
3   be returned with the container, further reducing waste and cost. Fig 2 illustrates an  
4   example of such a reusable container or box 201. Referring to Fig. 2, box 201 comprises  
5   a cover 202a attached to a bottom unit 202b by 2 hinges 203a, 203b. Cover 202a also has  
6   two latches 204a, 204b, which lock into slots 211a, 211b, respectively, in bottom unit  
7   202b. Holes 212 and 213 in bottom unit 202b and cover 202a line up to allow sealing  
8   box 201, for example with a plastic tie or seal.

9           A compartment 214 within box 201 contains the RFID 216 (shown in phantom).  
10       RFID 216 is distance and multi-readable in the preferred embodiment. By distance  
11       readable, we mean that RFID 216 can be read by reading apparatus from a distance  
12       (typically up to several feet). By multi-readable, we mean that several RFIDs can be read  
13       simultaneously or substantially simultaneously. This allows a whole pallet to be scanned  
14       at once, for example as it is loaded off or onto a truck. Such scanning can be done at any  
15       point along the shipping route or distribution chain, allowing for better tracking at low  
16       cost.

Box 201 is designed such that multiple boxes can be securely stacked on one another. For example, in Fig. 2, a foot 220 extends downward from the bottom of box 201. Foot 220 fits into and mates with a cavity in the cover of a box upon which box 201 is stacked. Similarly, box 201 includes a cavity in its top surface to receive the foot 220 of a box placed on top of box 201. (This cavity is not shown in Fig. 2, as it would be on the far side of cover 202a in Fig. 2.)

1 In one embodiment, the distribution chain can also use boxes that are half the size  
2 of box 201. Thus, two half-boxes can be placed together on top of (or below) full size  
3 box 201. Similarly, two quarter size boxes can fit on top of (or below) a half size box,  
4 and so forth.

5 Fig 3 shows a re-usable pallet 300, which comprises cavities 301a-d for receiving  
6 e.g. full size boxes. The pallet may also contain an RFID 302 for better inventory  
7 tracking. In other words, RFID can be used to track the location of pallet 302.

8 In one embodiment, there may also be 2 or 3 different heights of boxes in  
9 accordance with the invention. For example, there can be standard boxes of a given  
10 height, boxes of half that standard height, and boxes of a quarter of that standard height.  
11 Thus, when stacking goods on pallet 300, 2 half height boxes or four quarter height boxes  
12 can be stacked adjacent a full height box, allowing the vendor to mix and match many  
13 box sizes in a convenient manner on one pallet. If boxes are stacked on a pallet such that  
14 the total height of the boxes exceeds a certain height, the pallets may be shrink-wrapped  
15 to further stabilize them. Since the RFID allows scanning of all units on a pallet without  
16 physically reaching it, even RFIDs affixed to boxes buried within the pallet load can be  
17 scanned and inventoried.

18 The goods for a given purchaser are typically loaded into box 201 at warehouse  
19 150 (although they could also be loaded into box 201 at warehouses 140 or supermarket  
20 SML). At this time, a scanner 250 (Fig. 2) is used to read identification information from  
21 RFID 216, and that identification information is entered into a memory device 150b,  
22 along with information corresponding to the purchaser who is to receive the box.  
23 Memory device 150b can be a memory disk, memory tape, a semiconductor memory, or





1 the box 201 at the collection point. The computer that credits the purchaser's account can  
2 be either the same as or different from computer 150a. (In lieu of crediting the  
3 purchaser's account when box 201 is returned, the computer can bill the purchaser if box  
4 201 is not returned. within a predetermined time period such as 30 days.)

5 By introducing a redemption value to the containers, better, more sophisticated  
6 containers can be used, without incurring the otherwise prohibitive cost per shipping.

7 In another embodiment, the containers are never released to the end customer, but  
8 rather opened in his presence and merchandise is then handed to him at that point  
9 immediately. That removes the redemption burden from the customer, and it reduces the  
10 risk of chemical or other contamination or damage that might occur when the container is  
11 in the possession of certain users.

12 In yet another embodiment the container has no RFID, but uses conventional  
13 tagging methods like human readable indica or machine readable indica (or both human  
14 readable and machine readable indicia), such as bar codes, magnetic strips, etc. The use  
15 of a re-useable, resealable container in such a closed cycle system for dry goods in and of  
16 itself is considered novel by the inventors. Such use of a reusable container is further  
17 novel when delivering single orders to consumers or hand-off points as described above.

18 In another embodiment, based on the different vendors and products and/or  
19 product types shipped, the shipping consolidator can create a profile. For example, a  
20 computer such as computer 150a collects information concerning the buying habits of a  
21 particular customer. The information can include a) what type of goods the customer  
22 likes to buy; b) what kind of credit cards the customer uses; c) what types of vendors he

1 likes to buy from; etc. This can be used to target the customer for sending him  
2 advertisements.

3 In one embodiment, the customer is offered subsidized or free shipping in return  
4 for the customer's agreement that advertisements can be added to or placed in the  
5 reusable container (along with the merchandise). (Alternatively, the advertisements may  
6 be attached to the outside of the reusable container, or inserted into a portion of the  
7 container in such a way that the advertisements are nonetheless visible from the outside  
8 of the container, e.g. through windows in the container. Opt-in and opt out options can  
9 be used to allow the customer to choose whether or not to receive the advertisements.

10 The customer can receive a discount if he agrees to receive such advertising.

11 Alternatively, in other embodiments, the customer must pay an extra fee to not receive  
12 such advertisements. The advertising material is not limited to printed paper, but may  
13 also include digital media, such as CD ROMS, bar codes, URLs etc. In some  
14 embodiments, where the customer receives free shipping anyway, the proceeds of such  
15 advertising may be directed to the party paying for the shipping services.

16 In case the customers receive the containers, sniffer probes may be used on  
17 returned containers at certain points of the return path for empty containers, thus allowing  
18 the shipper to weed out such units and possibly bill the customer for it.